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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,842	10/14/2003	Tony Cruz-Uribe	200311559-1	8443

22879 7590 12/12/2006

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EXAMINER	
LIANG, LEONARD S	
ART UNIT	**PAPER NUMBER**
2853	

DATE MAILED: 12/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	**Applicant(s)**	
10/685,842	CRUZ-URIBE ET AL.	
Examiner	**Art Unit**	
Leonard S. Liang	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _01 September 2006 and 16 May 2006_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-17 and 69-73_ is/are pending in the application.

4a) Of the above claim(s) _71-73_ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-17 and 69-70_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _14 October 2003_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

This application contains claims 71-73 drawn to an invention nonelected with traverse in the applicant's response filed on 09/01/06. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01. The applicant argued, "Thus, rather than suggesting that each of the claimed species is mutually exclusive, Applicant's specification clearly suggests that the various techniques of the indicated species could be used in combination to achieve the desired method for effect in dispensing a single ligament of fluid...Clearly, there is nothing that would suggest that the identified species are mutually exclusive as argued by the Office Action." The examiner respectfully disagrees. The different factors are related to divergent characteristics, which were claimed as separate entities. The purpose of a species election requirement isn't simply to eliminate mutually exclusive species; it's to eliminate mutually exclusive species, which provide an undue burden on the examiner. The different factors listed, were divergent in the sense that different searches would need to be performed for each factor; thus they were considered mutually exclusive because they each stand on their own. As such, the prior election requirement is considered proper and is made final. Please note that the current office action will also be a final action. Even though the current action is made in response to the applicant's response to the election/restriction requirement filed on 08/01/06, that previous election/restriction requirement was made as a direct result to claim amendments filed on 05/16/06. Therefore, this action was necessitated by the response filed on 05/16/06, and will herein be made final.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 and 15-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Schmidle et al (US Pat 4686539).

Schmidle et al discloses:

- {claim 1} A method for dispensing a single ligament of fluid with an inkjet dispenser comprising: ejecting a first quantity of the fluid from the inkjet dispenser toward a substrate; and ejecting subsequent quantities of the fluid from the inkjet dispenser toward the substrate; wherein the subsequent quantities of fluid are ejected from the inkjet dispenser such that the first quantity of the fluid and the second quantity of the fluid form a single, continuous ligament of the fluid between the inkjet dispenser and the substrate (figure 11-12; abstract)

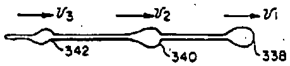

FIG. 11

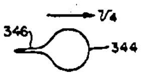

FIG. 12

- {claim 2} further comprising reducing a necking phenomena of the fluid (figure 11; column 1, line 44-column 2, line 10; note that satellite drop separation is a natural by-product of the necking phenomenon; thus Schmidle et al discloses reducing a necking phenomena)

- {claim 15} A method for dispensing a single ligament of fluid from a thermal inkjet dispenser comprising: ejecting a first quantity of the fluid having a head and a tail from the thermal inkjet dispenser toward a substrate; and ejecting subsequent quantities of the fluid having at least a head from the thermal inkjet dispenser toward the substrate; wherein the subsequent quantities of fluid are ejected from the thermal inkjet dispenser such that the head of each of the subsequent quantities of fluid catches the tail of a preceding quantity of fluid, thereby forming a single continuous ligament of the fluid between the dispenser and the substrate (figure 11-12; abstract)
- {claim 16} further comprising choosing the fluid to have a viscosity above two centipoise at an opening temperature of the inkjet dispenser (column 7, lines 23-30)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3-6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidle et al (US Pat 4686539) in view of Bagchi et al (US Pat 5916358).

Schmidle et al discloses:

- {claims 3-6 and 17} a method (as applied to claims 1 and 15 above)

- {claim 5} wherein the inkjet dispenser is disposed in an inkjet printer configured to form two-dimensional characters (inherent to invention)
- {claim 6} wherein the fluid comprises ink (abstract)

Schmidle et al differs from the claimed invention in that it does not disclose:

- {claim 3} wherein the reducing a necking phenomena comprises increasing a viscosity of the fluid
- {claim 4} wherein the reducing a necking phenomena comprises decreasing a surface tension of the fluid
- {claim 17} further comprising choosing the fluid to have a surface tension below 30 dyne/centimeter

Bagchi et al discloses:

- {claim 3} wherein the reining in a necking phenomena comprises increasing a viscosity of the fluid (column 13, lines 46-49 discloses "When the rate at which the ink is drawn from the nozzle exceeds the viscosity limited rate of ink flow through the nozzle, the ink in the region of the nozzle tip 'necks', and the selected drop separates from the body of ink." This implies that by increasing viscosity, the necking phenomena can be reined in.)
- {claim 4} wherein the reining in a necking phenomena comprises decreasing a surface tension of the fluid (column 1, lines 13-18)
- {claim 17} further comprising choosing the fluid to have a surface tension below 30 dyne/centimeter (column 43, line 44)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Bagchi et al into the invention of Schmidle et al. The motivation for the skilled artisan in doing so is to gain the benefit of using a low cost ink (column 3, lines 12-13).

Claims 7-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidle et al (US Pat 4686539) in view of Speakman (US Pat 6503831).

Schmidle et al discloses:

- {claims 7-14} a method (as applied to claim 1 above)

Schmidle et al differs from the claimed invention in that it does not disclose:

- {claim 7} wherein the inkjet dispenser is disposed in a solid freeform fabrication apparatus
- {claim 8} wherein the fluid comprises an object build material
- {claim 9} wherein the fluid comprises an object support material
- {claim 10} wherein the inkjet dispenser is disposed in a circuit formation apparatus
- {claim 11} wherein the fluid comprises one of a conductive circuit build material, a semi-conductive build material, or a dielectric build material
- {claim 12} wherein the single ligament of fluid contacts the substrate to form a circuit component
- {claim 13} wherein the circuit component comprises one of a transistor, a trace, a capacitor, a resistor, an antenna, a display, or a radiofrequency identification tag

- {claim 14} wherein the fluid comprises an adhesive or binder

Speakman discloses:

- {claim 7} wherein the inkjet dispenser is disposed in a solid freeform fabrication apparatus (abstract)
- {claim 8} wherein the fluid comprises an object build material (abstract)
- {claim 9} wherein the fluid comprises an object support material (abstract)
- {claim 10} wherein the inkjet dispenser is disposed in a circuit formation apparatus (column 1, lines 9-17)
- {claim 11} wherein the fluid comprises one of a conductive circuit build material, a semi-conductive build material, or a dielectric build material (column 1-2)
- {claim 12} wherein the single ligament of fluid contacts the substrate to form a circuit component (column 1, lines 9-17)
- {claim 13} wherein the circuit component comprises one of a transistor, a trace, a capacitor, a resistor, an antenna, a display, or a radiofrequency identification tag (column 13, lines 25-26)
- {claim 14} wherein the fluid comprises an adhesive (column 30, lines 51-56)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the invention of Speakman into the invention of Schmidle et al. The motivation for the skilled artisan in doing so is to gain the benefit of being able to form different electronic devices using ink jet technology (abstract).

Claim 69 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidle et al (US Pat 4686539) in view of Ishinaga et al (US Pat 6846054).

Schmidle et al discloses:

- {claim 69} A method for dispensing a single ligament of fluid with an inkjet dispenser (abstract); ejecting a first quantity of the fluid from the inkjet dispenser toward a substrate (figure 11, reference 338); refilling a firing chamber of the dispenser with a second quantity of fluid (abstract; figure 11, reference 340); ejecting the second quantity of the fluid from the inkjet dispenser toward the substrate (figure 11; abstract); wherein the second quantity of fluid is ejected from the inkjet dispenser such that the first quantity of the fluid and the second quantity of the fluid join to form a single ligament of the fluid prior to contacting the substrate

Schmidle et al differs from the claimed invention in that it does not disclose:

- {claim 69} refilling a firing chamber with a second quantity of fluid less than the first quantity

Ishinaga et al discloses:

- {claim 69} refilling a firing chamber with a second quantity of fluid less than the first quantity

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teachings of Ishinaga et al into the invention of Schmidle et al. The motivation for the skilled artisan in doing so is to gain the benefit of being able to more quickly eject the smaller drop to catch up to the bigger drop.

Claim 70 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidle et al (US Pat 4686539) in view of Ishinaga et al (US Pat 6846054), as applied to claim 69 above, and further in view of Chan et al (US Pat 5113199).

Schmidle et al, as modified, teaches all limitations of the claimed invention except for the following:

- {claim 70} wherein the refilling a firing chamber with a second quantity of fluid less than the fist quantity is performed by increasing backpressure in the firing chamber

Chan et al discloses, with respect to claim 70, a back-pressure regulating element for ink delivery systems (column 2, lines 37-50; this encompasses increasing backpressure to refill ink).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate Chan et al into modified Schmidle et al. The motivation for the skilled artisan in doing so is to gain the benefit of being able effectively control ink delivery.

Response to Arguments

Applicant's arguments filed 05/16/06 have been fully considered but they are not persuasive.

The applicant argued, "Schmidle fails to teach or suggest the claimed methods of that include producing a single, continuous ligament between a dispenser and a substrate. To the contrary, Schmidle expressly teaches a method of dispensing fluid that results in several droplets that "merge in flight [to] form a single or ultimate droplet..."

The examiner does not dispute that Schmidle expressly teaches a method of dispensing fluid that results in several droplets that "merge in flight [to] form a single or ultimate droplet. However, this does not imply that Schmidle does not also teach producing a single, continuous ligament. This ligament is produced in the process of creating the ultimate droplet. Figure 11 demonstrates this quite clearly. Furthermore, giving the claims its broadest reasonable interpretation, even the ultimate droplet that Schmidle discloses could be considered a single continuous "ligament".

With respect to the applicant's argument that "Schmidle does not even mention the necking phenomena," the examiner respectfully disagrees. Schmidle discloses reducing satellite droplet problems like ligaments tending to break up and cause splattering (column 1, lines 49-53). These are the exact problems that occur as a result of the necking phenomena. Schmidle does not explicitly have to use the phrase "necking phenomena" to describe problems associated with it.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard S. Liang whose telephone number is (571) 272-2148. The examiner can normally be reached on 8:30-5 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

12/10/06
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12/11/06
MANISH S. SHAH
PRIMARY EXAMINER